ABSTRACT

The present invention relates to methods of and apparatus for rapidly and accurately measuring the temperature of a small volume sample. The remote temperature sensor contains an optical interferometric sensor, preferably an extrinsic Fabry-Perot interferometer (EFPI), for measuring the difference in the distance traveled by a reference reflection and a sensing reflection. Because the refraction index of a solution is proportional to temperature, the output of the optical interferometric sensor can be converted to a temperature with a standard curve. Further, the present invention also provides methods and apparatus for measuring the temperature of the sample in performing non-contact (remote) thermocycling on small, micro to nanoliter, volume samples, wherein each cycle can be completed in as little as a few seconds.